

**Patent Claims**

1. Process for the preparation of storage-stable, multiple emulsions of the water/oil/water (W/O/W) type which comprise one or more active ingredients  
5 with the steps
  - a) stirring the active ingredient into an aqueous phase,
  - b) emulsifying the aqueous phase by passing the aqueous phase through a large-pored, porous membrane into an oil phase,
  - 10 c) phase inversion of the emulsion from b), by cooling the mixture at a cooling rate of at least 0.3 K/min, where an emulsifier is added either to the aqueous phase in a) or to the oil phase in b) or to both phases.
2. Process according to Claim 1, characterized in that the membrane used is a  
15 porous inorganic membrane, preferably ceramic membrane, particularly preferably membranes of aluminium oxide, zirconium oxide or titanium oxide, preferably of aluminium oxide.
3. Process according to Claims 1 to 2, characterized in that the pore size of the  
20 membrane used is 0.2 to 5  $\mu\text{m}$ , preferably 0.3 to 3  $\mu\text{m}$ .
4. Process according to one of Claims 1 to 3, characterized in that the oil used for the oil phase is a substance chosen from the series mineral oil, white oil or vegetable oil.  
25
5. Process according to one of Claims 1 to 4, characterized in that the emulsifier used is a nonionic emulsifier which is initially introduced in the oil phase.
6. Process according to one of Claims 1 to 5, characterized in that the  
30 emulsification in step a) is carried out at a temperature of from 30 to 35°C.

7. Process according to one of Claims 1 to 6, characterized in that the phase inversion according to step c) is carried out at a cooling rate of at least 1 K/min.
- 5 8. Process according to one of Claims 1 to 7, characterized in that the pressure difference over the membrane is  $0.5 \cdot 10^5 \text{ Pa}$  to  $25 \cdot 10^5 \text{ Pa}$ , preferably  $0.15 \cdot 10^5 \text{ Pa}$  to  $5 \cdot 10^5 \text{ Pa}$ .
9. Process according to one of Claims 1 to 8, characterized in that the process is  
10 carried out continuously in all steps.
10. Process according to one of Claims 1 to 9, characterized in that the active ingredient is a pharmaceutical active ingredient, preferably a pharmaceutical active ingredient for veterinary purposes, particularly preferably an antigen  
15 for a vaccine formulation.
11. Process according to Claim 10, characterized in that the active ingredient is chosen from the series comprising an antigen, preferably a virus or a microorganism, in particular a bacterium or parasite, or a preparation which  
20 comprises a peptide chain, preferably a protein or a glycoprotein, particularly preferably a protein or a glycoprotein which has been obtained from a microorganism, a synthetic peptide or a protein or peptides which has been prepared by genetic manipulation.
- 25 12. Multiple emulsion of the W/O/W type obtainable from a process according to one of Claims 1 to 11.
13. Use of the emulsion according to Claim 12 as vaccine for human or veterinary medical purposes.